

INPLASY

Prognostic value of systemic inflammatory response index in patients with bladder cancer: a systematic review and meta-analysis

INPLASY202650016

doi: 10.37766/inplasy2026.5.0016

Received: 4 May 2026

Published: 4 May 2026

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202650016

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 4 May 2026 and was last updated on 4 May 2026.

INTRODUCTION

Review question / Objective The systemic inflammatory response index (SIRI) has been confirmed to be associated with the prognosis of various solid tumors. The predictive value of the preoperative SIRI on the prognosis of bladder cancer (BC) patients remains unknown. Therefore, the current study performed a systematic review and meta-analysis to examine the association between preoperative SIRI and the prognosis of BC patients.

Condition being studied Bladder cancer (BC) is one of the most commonly diagnosed malignancies worldwide and the most common malignancy of the urinary system. According to the Global Cancer Statistics 2022, there were approximately 613,791 new cases and 220,349 deaths from BC. Based on the depth of tumor invasion, BC is classified as non-muscle-invasive bladder cancer (NMIBC) and muscle-invasive bladder cancer (MIBC).

METHODS

Participant or population Patients with bladder cancer.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included No restriction was placed on study type.

Eligibility criteria Studies were included if they met the following criteria: (1) articles reporting the relationship between SIRI and the prognosis of BC patients, using the formula $SIRI = (\text{Neutrophil count} \times \text{Monocyte count}) / \text{Lymphocyte count}$; (2) groups were classified according to their preoperative SIRI levels; (3) the major outcome indicators included survival outcomes, including overall survival (OS), recurrence-free survival (RFS) and progression-free survival (PFS); and (4) availability of hazard ratios (HRs) or odds ratios

(ORs) with 95% confidence intervals (CIs) or the ability to calculate them from the data presented in the articles. The exclusion criteria consisted of the following: (1) case reports, conference abstracts, editorials, and reviews; (2) studies with insufficient information and extractable data on the treatment and main outcomes of BC patients; (3) animal studies; (4) duplicates, or surveys investigating the same sample; and (5) the full text was unavailable.

Information sources PubMed, the Cochrane Library, Web of Science, Embase, Chinese National Knowledge Infrastructure, Wan Fang database, and VIP Chinese Science and Technology Periodicals Database..

Main outcome(s) Data from the articles were extracted and recorded in a Microsoft Excel spreadsheet (Microsoft Corporation, Redmond, WA) by two investigators (JH and FG) independently, including the name of first author, the year of study publication, study region (country), study design, number of study centers, mean or median age, sample size, treatment modality, follow-up time (months), SIRI cut-off, cut-off selection, and survival outcome, HRs or ORs with 95% CIs.

Quality assessment / Risk of bias analysis Two investigators (JH and FG) were involved in the quality evaluation using the Newcastle-Ottawa Scale (NOS), and a third party (JS) acted as adjudicator in case of disagreement. A higher score indicated a higher study quality, showing a positive correlation between the two. NOS scores range from 0 to 9, with studies classified as high (scores 7–9), moderate (scores 4–6), or low (scores 0–3) quality.

Strategy of data synthesis Meta-analysis was conducted using Stata 16.0 software (StataCorp). HRs and 95% CIs were computed as the combined effect size to assess the relationship between preoperative SIRI and survival outcomes. The Q test was used to analyze the heterogeneity among the results of the included studies. I² was utilized to quantitatively assess the magnitude of heterogeneity. Base on I² statistics, heterogeneity was categorized as high (above 75%), moderate (25% to 75%), and low (below 25%). When I² > 50% and/or P < 0.05, the random model was used; otherwise, the fixed model was used. Potential sources of heterogeneity were identified through subgroup analyses. If grouped data on subgroup categories were not available, they were excluded. In addition, the meta-analysis was also subjected to a sensitivity analysis in order to eliminate the effect of individual study data on

survival outcomes. The publication bias was evaluated using Egger's test. P < 0.05 was regarded statistically significant.

Subgroup analysis Potential sources of heterogeneity were identified through subgroup analyses. If grouped data on subgroup categories were not available, they were excluded.

Sensitivity analysis The meta-analysis was also subjected to a sensitivity analysis in order to eliminate the effect of individual study data on survival outcomes.

Language restriction None.

Country(ies) involved China.

Keywords Bladder cancer; Prognosis; Systemic inflammatory response index; Systematic review; Meta-analysis.

Contributions of each author

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